Richard Leslie Klein

EDUCATION

MD/PhD Candidate in Neuroscience	Georgetown University	2018-Present
Master of Science in Physiology	Georgetown University	2015-2016
Bachelor of Science in Biology	Davidson College	2011-2015

RESEARCH EXPERIENCE

Lab Rotation, NINDS *Bethesda, Maryland*
Dr. Kareem Zaghloul *Sept, 2020 - Dec, 2020*

- Single-unit utah array data collected from patients undergoing a semantic task to evaluate categorical and stimuli type effects in the medial temporal lobe. Univariate spike rate analyses were performed. Multivariate analysis including representational similarity analysis, reinstatement analysis and analyses using support vector machines were performed.

Lab Rotation, Georgetown University *Washington, DC*
Dr. Peter Turkeltaub *Mar, 2020 - Aug, 2020*

- Representational similarity analysis was used to examine the influence of diaschisis on the distributions of neural representations following stroke.

Lab Manager, Georgetown University Washington, DC
Riesenhuber Lab - Computational/Cognitive Neuroscience *Oct, 2016 – Aug, 2018*

- Experience using diffusion tensor imaging techniques to evaluate structural connectivity between visual, auditory and somatosensory in speech processing.
- Preliminary research to investigate the effects of social isolation and anhedonia within the cognitively normal aging population. Findings indicate increased atrophy in areas mediating social cognition and reward circuitry.
- In conjunction with Dr. Gustavo Deco's lab, I processed structural, functional and diffusion-weighted MRI data for use in a framework for estimating directed effective connectivity. This was applied to several datasets to evaluate functional changes after various training paradigms.
- *Hcorr*, an fMRI biomarker of neuronal sparsity, was applied to the HCP (900 subjects) and the Cam-CAN (650 subjects) datasets to evaluate whether various behavioral measures could be predicted as a function of sparsity, as well as to test the validity of *The Scaffolding Theory of Aging and Cognition*.
- Limited experience using deep learning simulations on a project to evaluate whether prior learning of visual categories can inform novel learning of visual categories using biologically plausible models of visual object recognition.

Undergraduate Researcher, Florida Hospital, Tampa Tampa, FL
Clinical Research with Drs. Ross and Rosemurgy of General Surgery *Summers 2013-2015*

Research experience involved collecting, maintaining, and interpreting large datasets. My research was largely based in analyzing financial costs of performing specific procedures as well as maintaining specialized surgical programs at hospitals. Others focused on the efficacy of specific procedures and the evolution of esophageal cancer.

TECHNICAL SKILLS

Matlab, R, Python, Bash and Javascript programming languages. Son of Grid Engine Job Scheduler, Amazon Web Services and Google Cloud Platform utilities for high performance computing. Building and

maintaining computers (Debian, Ubuntu). Experience with neuroimaging software packages SPM, FSL, Freesurfer, and Connectome Workbench for voxelwise, volumetric, ROI, searchlight, and probabilistic tractography based analyses. Experience with EEG processing packages EEGLAB and Brainstorm. Diffusion tensor imaging packages Mrtrix3. Data acquisition procedures include Eyetracking, EEG, and MRI. Experience with neural network packages Caffe and Tensorflow.

LEADERSHIP/ HONORS

Davidson College Varsity Football, Division I-AA	2011-2013
Pioneer Football League Academic Honor Roll	2012
National Honor Society	2011
Science National Honor Society	2011
Hillsborough Academic/Athletic Hall of Fame	2011
Berkeley Preparatory School Book Award for Art	2011
Captain of the Berkeley Preparatory School Varsity Football Team	2010
Scholastic Silver Key Award for Art	2007

PUBLICATIONS

Malone P, Eberhardt S, Sprouse C, Wimmer K, **Klein R**, Glomb K, Scholl C, Auer E, Bokeria L, Ronkin J, Deco G, Jiang X, Bernstein L, Riesenhuber M. Neural mechanisms of vibrotactile categorization. Human Brain Mapping (2019).

Rosemurgy A, Ryan C, **Klein R**, Wood T, Co F, Ross S. Financial Benefits of a Hepatopancreaticobiliary Program. The American Surgeon (2016)

Rosemurgy A, Ryan C, **Klein R**, Sukharamwala P, Wood T, Ross S. Does the cost of robotic cholecystectomy translate to a financial burden? Surgical Endoscopy (2015).

Rosemurgy A, Ryan C, **Klein R**, Sukharamwala P, Wood T, Ross S. What are the financial implications of centers for regional healthcare? Journal of the American College of Surgeons (2014).

PRESENTATIONS

Florida Hospital Tampa Summer Research Program, Tampa, Florida, July 26, 2013.
Cost Analysis of Regionalization on Healthcare, Pancreaticoduodenectomies.

POSTERS

Malone P, Eberhardt S, Sprouse C, Wimmer K, **Klein R**, Glomb K, Scholl C, Auer E, Bokeria L, Ronkin J, Deco G, Jiang X, Bernstein L, Riesenhuber M. Neural mechanisms of vibrotactile category learning. Society for Neuroscience (2017).

Cox P, Scholl C, Sprouse C, Ronkin J, **Klein R**, Wimmer K, Glomb K, Jaimes N, Deco G, Jiang X, Riesenhuber M. Escaping the frontal bottleneck: Extensive practice of a visual categorization task shifts category representations from dorsolateral prefrontal cortex to ventral occiptio-temporal cortex. Society for Neuroscience (2017).

Sukharamwala P, Patel K, **Klein R**, Wood T, Teta A, Ross, Rosemurgy A. Portal Vein Resection is Associated with Improved Survival after Pancreaticoduodenectomy for Pancreatic Cancer. Hepato Pancreato Biliary Association (2014).

ABSTRACTS

Malone P, **Klein R**, Riesenhuber M. Predicting individual differences in cognition using multimodal

machine learning. Organization for Human Brain Mapping (2018).

Klein R, **Klein R**, Ryan C, Sadowitz B, Sukharamwala P, Ross S, Rosemurgy A. Tu1772 The Evolving Landscape of Esophageal Cancer: A Four Decade Analysis. Gastroenterology (2015).

Rosemurgy A, **Klein R**, Ryan C, Sukharmwala P, Sadowitz B, Luberice K, Ross S. Has survival improved following resection for pancreatic adenocarcinoma. Hepato Pancreato Biliary Association (2015).

CONTINUING EDUCATION

NSCI-526, Introduction to Computational Neuroscience 2016

Coursera Johns Hopkins University Data Science Specialization 2016

Relevant Coursework: R, Regression Analysis, Github, Knitr, Statistical Hypothesis Testing, Hypothesis Testing, Model Selection, Generalized Linear Model, Ggplot2, Cluster Analysis, Natural Language Processing, and Student's Test.